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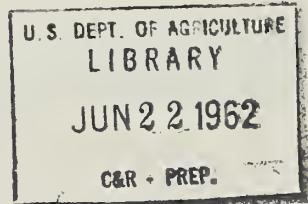
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After A
Hundred Years :

The
Yearbook
of
Agriculture
1962 //



Release date: The material in this brochure may
be made public after 9 a.m., Tuesday, May 15, 1962.

Notes for Reviewers and Other Interested
Persons about AFTER A HUNDRED YEARS and
Other Yearbooks of Agriculture.



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After a Hundred Years contains 108 chapters, 704 pages (688 + XVI), and 706 pictures. The 148 writers include 139 employees of the Department of Agriculture, 39 of whom work in places other than Washington; 7 staff members of land-grant institutions; 1 employee of the Department of Commerce; and the Executive Secretary of the Nebraska Public Library Commission. Thirty-five Extension and State college editors contributed data and photographs for the section, "Profile of Farming."

The 1962 Yearbook of Agriculture has 11 sections:

Backgrounds, an introduction to the methods and goals of agricultural research, the growth of the Department of Agriculture in its first century, and the diverse elements of farming in the United States.

Plants, several highlights of the work to develop improved plants, and the effect of light and chemicals on the growth of plants.

Conservation, a survey of needs and accomplishments in the program to protect and use wisely our soil, water, and watersheds.

Forests, a look at some of our forests and woodlands and their products, pleasures, and profits.

Animals, a sampling of the work in animal husbandry -- new breeds, feeds, breeding, diseases, and quarantines.

Insects, an outline of developments in insecticides, other controls of insects, aerosols, and quarantines.

Technologies, a summary of progress in electrification, communications, machines, farm methods, processing of food and fiber, and related aspects of the agricultural revolution.

Markets, five chapters about farmer cooperatives, market research, and the handling of products from farm to consumer.

Economics, an exploration of the problems of scarcity and abundance, the importance of credit and capital, programs to achieve economic stability in agriculture, parity, and the place of American agriculture in world agriculture.

So People May Know, an account of the methods, persons, and publications that keep Americans informed about progress in agriculture.

Homes, a description of a century's developments in housing, nutrition, and clothing.

Orville L. Freeman, Secretary of Agriculture, says in the Foreword: "We cannot measure in tons or dollars or even in terms of stomachs filled and bodies clothed the accomplishments of these hundred years in agriculture, for the achievement is not alone in numbers or amounts but in challenges met and responsibilities laid upon us."

"We can say that American farmers produce many times more than American farmers did a hundred years ago. We can say also that the number of our people who are ill fed and ill clothed has been reduced to a small fraction. Or that the technological revolution we are now in is far beyond the Industrial Revolution in scope and possibilities. Or that we have enough food in storage to see us through any emergency. All that is true, and we are grateful. But this is not the time for boasting; accomplishment makes vainglory unworthy of us."

"Rather, as the Department of Agriculture enters its second century, our productive genius, the elements of men and machines and resources that underlie our progress, and the abundance they have given us impose on us new opportunities and responsibilities. The goals are finite, not synthetic."

In the Preface, Alfred Stefferud (who has been editor of the Yearbooks since 1945) writes: "This Yearbook of Agriculture, one of a series that began before the Department of Agriculture was even thought of, is a sampler of progress in the hundred years since the Department was established. Just that; no more. It is not intended to be a history, although there is much of history in it. It is not a treatise of technology, although we consider many scientific developments. It is not a boastful report, although we who work in agriculture have much to boast of. It is not a complete survey of all that has happened in farming...."

"This sampler gives a few samples of the accomplishments on American farms and in laboratories in a century; a few indications of the problems so as to point up the extent of the achievements; a few of the ways that have helped our farmers produce so abundantly, a few of the tasks performed by the Department and its related institutions for the well-being of all Americans; a few of the reasons why agriculture is so important to everybody and why a healthy agriculture is important to a healthy general economy."

After a Hundred Years is the sixty-third Yearbook of Agriculture to be published since 1894, when these annual publications of the United States Department of Agriculture were first called Yearbooks. The series, however, dates from 1849, when the Commissioner of Patents, in whose Bureau the Federal work in agriculture was centered then, issued his annual report in two parts, Part II of which was devoted to agriculture.

In a typical year, the planning and outlining of a Yearbook starts in early fall. Chapters are assigned, and manuscripts are received by the editor in late spring or early summer of the following year. Editing the chapters usually takes about 6 months. From the time the first copy goes to the printer, it takes another 8 or 9 months before the page proofs are returned to the printer. Another 3 or 4 months elapse before the book comes off the press. In all, it takes more than 2 years from planning to publication. Two -- sometimes three -- Yearbooks therefore are usually in some stage of planning or production simultaneously.

Letters indicate that readers of the Yearbook include farmers, city people, high school and college students, businessmen, economists, teachers, Government officials, housewives, county agents, farm and club leaders, conservationists, writers, and many general readers.

Worldwide distribution is made on an exchange basis with libraries and agricultural research institutes and through United States agencies overseas.

Before the subject of a Yearbook of Agriculture is chosen, the major problems, interests, and work of the Department, farmers, and other farmworkers are considered. The importance of a proposed subject to farmers and the general population, the number of persons who want information on it, and the availability of material and contributors are other factors that bear on the selection of the topic.

Each year the Secretary of Agriculture names a Yearbook Committee, whose members represent the sections of the Department that have an interest in the subject. They do the preliminary planning and outlining and act as technical consultants.

The members of the 1962 Yearbook Committee are:

R. Lyle Webster, Office of Information, Chairman.

Martin A. Abrahamsen, Farmer Cooperative Service.

Robert T. Beall, Rural Electrification Administration.

Philip S. Brown, Farmers Home Administration.

Albert S. Foster, Soil Conservation Service.

Arthur W. Greeley, Forest Service.

H. L. Haller, Agricultural Research Service.

Gerald H. Huffman, Federal Extension Service.

George S. James, Forest Service.

Joseph G. Knapp, Farmer Cooperative Service.

Nathan M. Koffsky, Economic Research Service.

W. A. Minor, Foreign Agricultural Service.

H. A. Rodenhiser, Agricultural Research Service.

Kennard O. Stephens, Agricultural Stabilization and Conservation Service.

Murray Thompson, Agricultural Stabilization and Conservation Service.

Darnell M. Whitt, Soil Conservation Service.

Department regulations specify: "Distribution. -- To Congress as specifically required by law on the basis (since 1933) of 550 to each Senator and certain Senate officers, and 400 to each Representative and certain House officers. Department distribution (usually 12,000 copies) is limited to workers in the Department and to certain libraries, educational institutions, cooperating State extension and experiment station workers; on sale by the Superintendent of Documents to all others."

The older Yearbooks and those issued in 1936, 1937, 1938, 1939, 1941, 1942, and 1943-1947 are out of print, but copies of the others are for sale by the Superintendent of Documents. An order form is printed on the last page of this brochure.

The Yearbook is a Congressional document, produced in the Department of Agriculture, as required by law, with an appropriation made specifically by the Congress.

No person or agency in the Department of Agriculture has copies for general distribution.

The production of one edition of the Yearbook in a typical year requires 650,000 pounds of paper, 37,520 yards of cloth, 1,262 pounds of ink, and 6,426 pounds of metal.

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Each Yearbook of Agriculture since 1936 has been devoted to a single, broad, significant segment of agriculture and agricultural science. This list gives the number of copies distributed by the Department, Members of Congress, and the number sold by the Superintendent of Documents.

Date	Title	Number Printed for: U.S.D.A.	Congress	Copies Sold by Sup. Doc.*
1936	<u>Better Plants and Animals</u> (Vol. I)	15,000	231,650	10,318
1937	<u>Better Plants and Animals</u> (Vol. II)	15,000	231,650	9,363
1938	<u>Soils and Men</u>	15,000	231,650	11,597
1939	<u>Food and Life</u>	15,000	231,650	13,074
1940	<u>Farmers in a Changing World</u>	15,000	231,250	17,907
1941	<u>Climate and Man</u>	15,000	232,153	21,097
1942	<u>Keeping Livestock Healthy</u>	15,000	231,591	74,970
1943-47	<u>Science in Farming</u>	10,000	231,250	38,969
1948	<u>Grass</u>	10,000	231,250	51,656
1949	<u>Trees</u>	15,903	230,850	88,283
1950-51	<u>Crops in Peace and War</u>	12,000	230,850	14,898
1952	<u>Insects</u>	12,000	230,850	64,352
1953	<u>Plant Diseases</u>	12,000	230,850	37,778
1954	<u>Marketing</u>	10,000	230,850	18,046
1955	<u>Water</u>	12,000	230,850	44,047
1956	<u>Animal Diseases</u>	12,000	230,850	43,654
1957	<u>Soil</u>	12,000	230,850	42,453
1958	<u>Land</u>	12,000	230,850	27,303
1959	<u>Food</u>	17,500	319,318	61,205
1960	<u>Power to Produce</u>	12,000	233,050	13,335
1961	<u>Seeds</u>	12,000	174,736	19,831

Quotations from After a Hundred Years, the 1962 Yearbook of Agriculture

"President Abraham Lincoln on May 15, 1862, signed a bill that established the Department of Agriculture. The bill was one of three designed to serve the interests of the family farmer. The other two were the Homestead Act, May 20, and the Land-Grant College Act, July 2. Isaac Newton took the oath of office as first Commissioner of Agriculture on July 1. He inherited the staff of nine employees and facilities of the Agricultural Division of the Patent Office." Wayne D. Rasmussen and Gladys L. Baker (page 7).

"Land-grant institutions enrolled one-fifth of the total college population in 1962. They granted 40 percent of the doctoral degrees in all subjects. These doctorates included about half of the Nation's total in the science, engineering, and health professions; all of those in agriculture; and approximately one-fourth of the total in the arts and languages, business and commerce, and education. But the purpose of land-grant institutions is the same as it was 100 years ago: To provide educational opportunities for all, to conduct research for the betterment of man, and to disseminate knowledge and information to all people." C. R. Elder (pages 16 and 20).

"We can say, if you want to know progress in agriculture, visit the Agricultural Research Center near the town of Beltsville in Maryland, 15 miles northeast of the Nation's Capital, on U. S. Route 1. The center has been the core of revolution and progress in agriculture since it began in 1910, when the Department of Agriculture bought 475 acres for an experimental farm.

"Beltsville is unique also as a center for basic research, which seeks new knowledge to advance science rather than the solution of a specific problem." Marguarette M. Hedge (page 44).

"Scientists of the Department of Agriculture apply chemistry, engineering, microbiology, physics, mathematics -- the sciences that have produced thousands of new goods and services, largely from nonagricultural resources -- to develop new uses for agricultural products.... The research, which we call utilization research, often discovers ways to preserve and protect the native good qualities of farm commodities and to make modified and new products." C. H. Harry Neufeld and Russell T. Prescott (page 45).

"The Department of Agriculture since 1898 has had a formal organization whose main concern is the exploration for useful plants, their introduction and evaluation for crop potentials, and the preservation of breeding stocks of value in American agriculture. Department explorers have collected more than 275 thousand introductions from all parts of the world.

"...Howard Scott Gentry, a senior plant explorer of the Department of Agriculture...has traveled the world over -- the Alps of southern Europe for legumes and grasses, the hill country of Afghanistan and India for forages and food crops, the deserts of Mexico and our Southwest for drug and industrial plants, and South Africa for new oilseeds. He has made 9,500 collections." John L. Creech (pages 100 and 105).

"About 95 percent of our corn acreage now is planted to hybrid corn. We produce at least 20 percent more corn on 25 percent fewer acres than in 1930, when seed of hybrid corn became available in quantity to American farmers.

"Besides an increase in production, other benefits have been achieved by the use of hybrid seed. Hybrids make more efficient use of applied fertilizer. Progress has been made in developing hybrids resistant to some insects and diseases; the result is a product of higher quality and a more stable yearly production." G. F. Sprague (pages 106 and 107).

"The story of the improvement of wheat has no beginning and no ending. Improvements are made every year.

"It came to us from halfway around the world as food for colonists in the New World or in the luggage of immigrants, who knew its worth.... Wheat was beginning to look like a native in America by 1859. Now it is grown regularly in 44 States." L. P. Reitz (page 108).

"The 1895 Yearbook of Agriculture listed 200 weeds that were serious obstacles to agriculture in the United States; 108 of them came from abroad.

"Weeds cause losses of millions of dollars to American agriculture, because they reduce yields of crops and prevent the efficient use of land." W. B. Ennis, Jr. (page 124).

"American farmers 100 years ago got an average of about 80 bushels of potatoes an acre. The average was 100 bushels 50 years ago and 120 bushels 25 years ago. Then, beginning in 1940, yields shot up to about 300 bushels.

"Systematic and scientific breeding of potatoes was started by the Department of Agriculture and by a few State agencies during 1910-1920.... More than half the potatoes grown in this country in 1962 were varieties produced by the Federal-State breeding work and unknown 30 years earlier." Victor R. Boswell (page 130 and 131).

"We now grow grass and forage on a billion acres. We set a value of 5 billion dollars a year on this enterprise, but we have no good way to measure its great value in conserving soil, stabilizing agriculture, and lining up better the production of other crops with our need for them. Grassland agriculture, as we call it, is a major new development.

"Somewhere or other on the grasslands are grown more than 125 different species of forage grasses and legumes." Hugo O. Graumann and Mason A. Hein (page 133).

"A new family of regulating chemicals retard rather than stimulate plant growth. Some kinds of plants, such as chrysanthemum and azalea, can be dwarfed in a way that is often beneficial, since the plants take up less space, require less pruning, and develop a usually pleasing foliage." John W. Mitchell and Paul C. Marth (page 143).

"More than 400 viruses infect plants. More than 150 viruses infect animals.... Viruses are too small to be seen under an ordinary light microscope. The largest viruses are smaller than the smallest bacteria.... Plant viruses are thought to interfere with the normal enzyme reactions or with growth regulator systems necessary for normal growth." L. C. Cochran (page 147).

"A hundred years ago there was an average of about 60 acres of land for every man, woman, and child counted in the 1860 Census.

"In 1900 the total United States population had passed 75 million, but even then there was no shortage of land. There was still an average of 25 acres to supply the food, fiber, and other needs of each person. The per capita acreage of land had shrunk to 15.5 by 1930, a reduction of 40 percent in three decades." T. S. Buie (pages 152 and 155).

"The 49'ers and gold rush prospectors who went west cursed the streams they had to ford and hated the snows that blocked their trails. A hundred years later the streams and snow transmute desert valleys into a prosperous region that produces farm goods of greater value each year than the total value of all the gold extracted from the mines since the first gold nugget was found." William W. Donnan and A. L. Sharp (page 181).

"The time required to produce a soil is a misunderstood factor. A deep, potentially productive soil may form in a single day with a deposit of a new alluvial terrace along a river or with a new shower of volcanic ash. It may take millions of years to produce a soil on the rocky face of a dry mountainside.

"Today's Soil Survey makes possible a host of predictions: The crops that can be grown and by what methods; the yields of these crops under the principal alternative combination of practices; the practices to control runoff and erosion; and the kind of arable soil that results from combinations of drainage, irrigation, land leveling, fertilization, liming, cropping, and so on.... The soil map, and our knowledge of how each soil responds to management, is the best basis for farm planning, as already demonstrated, on at least 2 million American farms and ranches. It is the best basis for planning communities, including those in the urban fringe. It gives the land appraiser a clear statement of the potential productivity of soils for use." Charles E. Kellogg (pages 191 and 194).

"Wood has as many differences in strength, machinability, resistance to decay, gluability, and so on as there are species of trees. To determine the properties of the various woods and to investigate the multitude of problems of wood utilization were the tasks assigned the Forest Products Laboratory when it was founded in 1910.... Although our annual per capita consumption of lumber has declined slowly since 1900, markets for other wood and wood-based products have increased greatly our total demand for wood." Edward G. Locke (page 210).

"The total area of forest in the United States in 1962 was about 770 million acres, or one-third the land area. Some 530 million acres are commercial timberlands, managed for or capable of yielding such industrial wood as sawlogs and pulpwood and not reserved from cutting. The other 240 million acres are too unproductive to manage for wood production (although they are useful for watersheds, grazing, and other purposes) or are productive but reserved for parks or other special purposes. About 70 percent of our timberlands is privately owned by some 4.5 million owners." H. R. Josephson and R. C. Wilson (page 229).

"New trees have come from research by forest geneticists, who by careful selection and controlled breeding have incorporated desirable characters in trees of hybrid origin.... Work like this is done at the Western Institute of Forest Genetics at Placerville, Calif., a part of the Pacific Southwest Forest and Range Experiment Station." H. A. Fowells (page 233).

"About 12 thousand fires burn an average of 200 thousand acres of the National Forests each year. Many more start, but all but one in a hundred are put out before they can do much damage. To protect the forests, we have a highly skilled organization of many men, the experience of six decades, and the newest techniques." Merle S. Lowden (page 238).

"A legend of the Snoqualmie Indians is that the inhabitants of the moon came to earth, settled in and near what is now the Snoqualmie National Forest of Washington, and founded the Snoqualmie Tribe.

"The Snoqualmie National Forest now encompasses much of this land of historic interest, scenic beauty, and economic value. Snoqualmie, almost as large as Delaware, is one of 155 National Forests, which cover more than 181 million acres." Morris Mash (page 253).

"The virgin forests a century ago were logged by rugged, reckless men. They used the ax and crosscut saw for felling, limbing, and bucking, which now are done largely with chainsaws powered by gasoline or electricity, but still with the help of the ax." J. J. Byrne (page 257).

"Like the history-making achievements of penicillin in human therapy, antibiotic fungicides usher in a new era of disease control in forestry -- an era that could mark the beginning of the end for many tree diseases...." Warren V. Benedict (page 262).

"The forest and its wild animals are inseparable, because the forest provides them with their daily and yearlong needs. There is cover for escape, hiding, rearing young, and for loading. The forest provides many kinds of food." Lloyd W. Swift (page 269).

"Livestock on American farms a century ago were mostly the descendants of nonpedigree types brought from Europe by settlers, who usually were too busy subduing a new land to put much effort into improvement of animals.... Imported breeds today dominate many sectors of our livestock production, but efforts of our scientists and the genius of American breeders have brought about the development of new breeds at perhaps a more rapid pace than at any time in history." Everett J. Warwick (page 276).

"An outstanding development in the nutrition of farm animals was the discovery and identification of the vitamins. Research since 1920 has helped us identify many abnormal conditions as due to a deficiency of one or more factors." N. R. Ellis and L. A. Moore (page 283).

"Market differences exist between ruminants and monogastric -- simple stomach -- animals in their metabolism of carbohydrates. Carbohydrates are broken down to the simple sugars and absorbed as such from the alimentary tract by monogastric animals, but only small amounts of carbohydrates are handled in a similar manner by ruminants." Ivan L. Lindahl (page 287).

"Almost every function of the animal organism is influenced by hormones produced within the body. Hormones act together; the secretion from one gland often affects the secretion of another gland. Hormones are the major chemical integrators of the many reactions involved in growth and development; the production of meat, milk, and eggs; and reproduction." Joseph F. Sykes (page 292).

"A group of dairymen in New Jersey organized in 1938 the first co-operative in the United States for the artificial insemination of their cows. This method of serving females without natural mating has since become one of the most significant programs for livestock improvement in the history of American agriculture." Harvey E. Shaffer (page 297).

"A few years ago the producer of broilers expected to take 13 weeks to grow a 3-pound bird. Now he can market his flock at 3.5 pounds in only 9 weeks plus 2 or 3 days. Instead of requiring 4.5 pounds of feed per pound of broiler produced, less than 2.5 pounds is needed. The national average egg production was 134 eggs per hen in 1940 and more than 200 in 1962." Steven C. King (page 304).

"The Congress established in 1886 in the Bureau of Animal Industry a Zoological Division for the study of parasitisms. It is now the Beltsville Parasitological Laboratory.... Here in 1891 began a research collection of preserved 'type specimens' of parasites and the indexing of the world's parasitological literature.... Technical studies at the laboratory are supported by pasture investigations and other studies and by work at four smaller laboratories in important farming areas." Lloyd A. Spindler (page 310).

"Americans consume more than 160 pounds of meat per capita annually. They have confidence in the wholesomeness and truthful labeling of the meats they buy. The protection given consumers costs the public only about 1 cent a person a month, which is nothing compared to the cost in money and health of one purchase of adulterated or tainted food." C. H. Pals and K. F. Johnson (page 324).

"An effective system of animal inspection and quarantine was developed by 1890. Regulations have been revised periodically as animal diseases have appeared or been eradicated in other parts of the world. Today the animal inspection and quarantine system of the United States is internationally recognized for its efficiency." Harold A. Waters and L. C. Heemstra (page 325).

"When DDT was first introduced, house flies were so susceptible to its action that the application of a few ten-millionths of a gram to a fly sufficed to kill it. Now some flies that have been selected out by the treatment of many successive generations are so resistant that they can thrive in a screen cage solidly coated with DDT." Ruth L. Busbey (page 335)

"The Boll Weevil Research Laboratory of the Department of Agriculture was completed in 1961 at State College, Miss. The ultimate goal of research there and elsewhere is the eradication of the boll weevil. An immediate objective is to relegate it to the status of a minor pest. It and other problems of cotton insects are being investigated in all the main cotton States." C. F. Rainwater (page 339).

"Thus the day has come when with suitable equipment the potato grower can plant his crop, fertilize it, and apply insecticides to protect it from the potato leafhopper, aphids, and possibly the Colorado potato beetle, all in one operation." L. B. Reed, R. C. Bushland, and G. W. Eddy (page 342).

"Some insects kill other insects, and it would be to our advantage if we could turn the good ones -- parasites and predators -- loose on the bad ones, the many destructive species that are their natural enemies.... About half of the worst pests in the United States are foreigners. We have put the main emphasis in biological control, therefore, on the introduction and establishment of beneficial species from their native homes." Philip B. Dowden (page 347).

"Insects lose their power to reproduce when they are bombarded by gamma rays from a radioactive cobalt source. If large enough numbers of sterile insects are released to overflow the natural populations, the ability of normal insects to propagate is affected.... Calculations made by E. F. Knipling, an entomologist in the Department of Agriculture and the originator of this new concept, indicate that continued releases of large numbers of sterile insects may bring about the elimination of a species within a few insect generations." L. D. Christenson (page 348).

"Searching for a way other than oil sprays to apply insecticides in the form of very fine particles, a chemist, L. D. Goodhue, and an entomologist, W. N. Sullivan, both of the Department of Agriculture, first tried burning mixtures of derris or pyrethrum, cornstalks, and sodium nitrate to produce a smoke. This was effective, but a large part of the insecticide was destroyed in the combustion process.... The scientists in 1941 got the idea of dissolving the insecticide in a liquefied gas under pressure in a container and letting the solution escape through a nozzle with a tiny opening.... Goodhue and Sullivan described this invention in 1941 and obtained a public-service patent, under which royalty-free licenses were issued for the manufacture of insecticidal aerosols until it expired in 1960." R. A. Fulton and W. N. Sullivan (page 358).

"Major efforts in developing resistant plant varieties have been to control insects that attack field crops.... This means of control can be used without cost to the grower, without creating toxic residue to man and wildlife, and without damage to pollinating insects. It does not upset Nature's balance between insects and their natural enemies." Reynold G. Dahms (page 364).

"Entomologists and chemists in the Department of Agriculture have pioneered in the use of materials capable of attracting insects, an approach that has been successful against the Mediterranean fruit fly and the gypsy moth. The lures, usually in traps, can help find foreign insect species before they can gain a firm foothold here." Morton Beroza and Nathan Green (page 365).

"Soon after our entry into the war, the Surgeon General's Office of the United States Army arranged for funds to support research by the Department of Agriculture on the control of the body louse. The investigations were

started in April 1942, in Orlando, Fla. Within a year, control methods were developed that permitted the Army and the Rockefeller Foundation to stop typhus in Naples in 1943 and 1944, thereby demonstrating that typhus epidemics no longer need be a cause of human misery and suffering." E. F. Knipling and A. W. Lindquist (page 372).

"Passengers going abroad by air and sea nowadays are handed a leaflet that in four languages sounds an important warning: 'Did you know that plant pests and animal diseases that destroy crops and livestock often travel from one country to another in passenger baggage? ...Do not bring such items to the United States unless you have a permit from the United States Department of Agriculture.'" E. P. Reagan (page 377).

"Many city people and a new generation of farm youngsters are incredulous when they discover how recently it was that electricity came to rural America. Only about one farm in ten was electrified in 1935. Even by the end of the Second World War, nearly half of our farms and ranches still lacked power. More than 97 percent were electrified in 1962, along with millions of rural schools, churches, commuters' homes, and business firms. The task of pushing powerlines into every corner of the rural United States was accomplished during the past quarter century, in the years since the Rural Electrification Administration was created." Hubert W. Kelley (page 384).

"Today's rural telephone service, provided by REA-financed borrowers in 45 States, is fast, efficient, and modern." Bernard Krug (page 401).

"The substitution of automatic controls for human supervision is one of the important principles of farm technology and mechanization." Lowell E. Campbell and Hoyle B. Puckett (page 402).

"The farmstead is the livestock farmer's place of business -- his factory. As in any factory, his management practices, the layout of his facilities, and the methods and types of equipment he uses influence how much he produces and how long and hard he must work to do it." John W. Rockey, Robert G. Yeck, and Norman C. Teter (page 411).

"The labor needed to harvest our 17 million tons of fruit has become costlier and scarcer each year since the Second World War.

"The Department of Agriculture recognized the need for mechanizing the fruit harvest and in the fifties began research in cooperation with Michigan State University, the University of California, and Washington State University." Jordan H. Levin (page 418).

"The plow that tills the soil so seeds can grow is the symbol of agriculture, and the plowman is the farmer. Farmers over the centuries perfected the sticks, crooked beams, and shares they used to turn the earth and make a seedbed. Beyond a certain point they could not go. They could not make the necessary force measurements, which require the special skills of scientists and engineers. So the Department of Agriculture built the National Tillage Machinery Laboratory at Auburn, Ala.... The purpose of the laboratory is to study the basic principles of the design and use of tillage tools." W. R. Gill and A. W. Cooper (page 423).

"About 40 percent of our cotton was picked by spindle-type pickers and 15 percent by stripping machines in 1962. Mechanical harvesting was a giant step of progress, but it created problems for the ginner. Handpickers send seed cotton to the gin relatively clean and dry, but the machines send it in varying conditions, ranging from fairly clean and dry to very damp and dirty. The ginner must remove the moisture and trash in order to produce a quality of ginned lint that will give the farmer a profitable return." Vernon P. Moore and Rex F. Colwick (page 432).

"A farmer a century ago did his own weather forecasting by observing the "feel" of the air, such signs as low-flying swallows, and the way the sky looked. It was a matter of lore, superstition, tradition, or guess-work.... Today's farmer uses information about weather and climate as one of his operating procedures. He can time his plowing, sowing, spraying, and reaping in accordance with reliable, scientific forecasts." Edward M. Vernon (page 433).

"More than a billion dollars' worth of farm products are sold each year to the chemical industry, whose production totals about 40 billion pounds a year.... Its products are sold to every section of American industry and include fibers, surface coatings, plastics and resins, fertilizers, rubbers, medicinals, pigments, explosives, solvents, printing inks, pesticides, dyes, antifreezes, adhesives, bleaches, wood preservatives, flavorings, photographic chemicals, refrigerants, water-soluble gums, and paint driers." C. H. Fisher and Johannes H. Bruun (page 445).

"Scientists learned to grow selected micro-organisms in pure culture under defined conditions as to nutrients and environment. This led to the development of industrial fermentation, one of the most important areas of science to benefit mankind during the past century. Hundreds of species of micro-organisms ferment agricultural materials, directly or indirectly, into chemicals, foods, feed supplements, drugs, vitamins, and antibiotics." Harlow H. Hall and John L. Etchells (page 450).

"The first cold storage warehouse was built in New York in 1865; 1,400 cold storage warehouses, capable of handling a million carloads of products a year, now serve the food industry." M. J. Copley, Sam R. Hoover, W. B. Van Arsdel, and John R. Matchett (page 454).

"The use of starch has grown tremendously. More than 150 million bushels of grain, mostly corn, were processed in 1962 for starch. A little more than half of the nearly 5 billion pounds of cornstarch produced annually in the United States is converted into corn sirup and dextrose sugar." F. R. Senti and G. O. Kohler (page 462).

"Scientists have learned how to manipulate and modify the structure of wool to produce fabrics of superior launderability -- without sacrificing the natural beauty and soft texture of wool. The Department's Wool and Mohair Laboratory in Albany, Calif., has found a way to give fibers a permanent, chemical surface coating. Suitings, knitted wear, blankets, and other articles so treated can be machine washed safely and repeatedly without shrinking and dried with little or no mousing." Harold P. Lundgren and Mason DuPre, Jr. (page 469).

"In 1961, when farm marketings of agricultural commodities were worth approximately 35 billion dollars, more than 3 thousand Federal employees and 4 thousand employees of the State departments of agriculture and other local agencies were engaged in the grading of commodities for quality and condition. The grading program, largely voluntary, is financed by either a combination of Federal and State appropriations and revenue or revenue alone, paid directly to the Government agencies by the users of the service. The revenue paid by the users in 1961 amounted to almost 22 million dollars -- more than 80 percent of the total cost." S. T. Warrington (page 491).

"Farmer cooperatives have become an important factor in American agriculture during the past century. Whether in 1862 or 1962, farmers have looked to their cooperatives to help them increase income, build market outlets for an expanding output, and obtain supplies and services for an increasingly complex and mechanized farm production system." Joseph G. Knapp and Anne L. Gessner (page 501).

"The average American farmworker in 1862 produced enough food and fiber to support fewer than five persons. That simple fact we should keep in mind when we consider how the productivity of American farms has increased since then to the point where the average agricultural worker can supply the needs of 26 persons and what that increase means.... This success in agriculture has brought its reward -- but the reward has gone to the American consumer and not to the American farmer." Kennard O. Stephens (page 506).

"The Crop and Livestock Reporting Service and the Market News Service supplement each other. Together they provide the Nation with a continuous flow of information from the time the farmer is making his plans to plant (the intentions-to-plant reports) to the sale of his products (the day-to-day market reports)." S. R. Newell and S. T. Warrington (page 534).

"Our growth in population has expanded the prospective requirements for land and water and has intensified the competition among the uses of land and water for agricultural, industrial, urban, transportation, and recreational purposes. Getting and interpreting the facts and evaluating alternative methods of meeting multiple requirements are a major task." J. P. Cavin (page 538).

"The search for income parity for agriculture has been going on a long time. The Virginia Colony attempted in 1621 to stabilize tobacco prices by limiting production and burning surpluses. The search began on a national scale with the close of the Civil War....

"The search for parity is not ended. Parity has not been achieved, but neither is it lost. The search must go on. Our experience is a foundation for programs of the future." Murray Thompson (pages 543 and 556).

"The amount of capital invested in the average farm increased sevenfold from 1940 to 1960. Part of the increase was due to the increased use of machinery, fertilizers, and insecticides -- inputs that take the place of farm labor." Philip S. Brown (pages 562 and 566).

"People are the main element in agriculture -- people who work to produce food so other people can live and fiber so people can be clothed. People therefore are the primary element in farm programs to the extent that they help farm families live better and farm better and so help everybody. This human side of agriculture is stressed in the supervised credit service of an agency of the Department of Agriculture." Philip S. Brown (page 567).

"The Department of Agriculture estimates that by the year 2000 we may need more than twice the agricultural production we have today to supply an expected population of 329 million. This would equal the production from 400 million acres of additional cropland at present yields. We do not have 400 million more acres of land suitable for cultivation. The anticipated demand for farm products obviously will have to be met mainly from the land already in agricultural use." Donald A. Williams, Gladwin E. Young, and Ben Osborn (pages 576 and 578).

"The Department of Agriculture in 1961 inaugurated a national Rural Areas Development Program. The Secretary of Agriculture established National and State boards and committees to help get work started in the localities as fast as their leaders wanted to move forward.... The Rural Areas Development Program encourages rural and town leaders to take actions that will help their areas adjust to the farm revolution." Joseph C. Doherty (page 585).

"Large amounts of our agricultural commodities have been sold abroad or used to help other countries. They have been sold for dollars, for foreign currencies, or on credit. They may have been bartered or donated.... Nearly 5 billion dollars' worth of agricultural commodities were exported in 1961. Seventy percent represented sales for dollars through regular commercial channels." John H. Dean (page 594).

"The farmers of America in 1961 supplied nearly one-fifth of the volume of farm products that entered world trade. Farm commodities shipped abroad accounted for the output of about 60 million acres of our cropland and represented the production of 1 in 6 harvested acres. To ship these products abroad, arrangements were made for financing, inland transportation, storage, and ocean shipping for 41 million tons of cargo -- enough to fill a million freight cars or more than 4 thousand cargo ships. The volume in 1961 was more than 12 times greater than the agricultural exports at the close of the Civil War." Robert L. Tontz and Harry W. Henderson (page 597).

"To carry on their global trade in farm products, a business that bears directly on the lives of nearly 3 billion persons, the United States and many other countries have a system of agricultural intelligence whereby they get and assess facts to enable producers to market their crops abroad advantageously and help consumers obtain the products they need.... In the United States, this information is supplied largely by the Foreign Agricultural Service, an agency of the Department of Agriculture." Audrey Ames Cook (page 604).

"Getting facts about agriculture to the people who want them has been a basic part of the work of the Department of Agriculture since it began. The law signed by President Lincoln in 1862 directed the Department to 'acquire and diffuse among the people of the United States useful information on subjects connected with agriculture.' The phrase 'among the people' - was prophetic. The Department's work and information activity were geared in the beginning to the needs of farm people, but as the work grew from the conduct of research and the collection of statistics of crops and livestock to include educational, regulatory, service, conservation, credit, and action programs, its functions have come to touch the lives of people in the United States and in many foreign lands." Harold R. Lewis (page 626).

"The first Commissioner of Agriculture outlined seven primary programs for the new Department. One was to establish an agricultural library that would 'form a rich mine of knowledge,' with publications accumulated through exchange, gifts, and purchase.... It has become known and serves as the National Agricultural Library." Louise O. Bercaw (page 634).

"...an awareness has grown among farmers (and other citizens) in this age of science that reading helps one do more things better, that books are practical tools, that the printed word deepens the meaning of life and work.... The Congress in 1956 enacted the Library Services Act, which provides funds to help States develop methods of bringing library services to residents of small towns, villages, and farming communities which are without such service." Louise A. Nixon (page 638).

"Altogether, 85 million Americans from farm and city visit our 2,158 agricultural fairs each year. They and the millions who have visited fairs since 1810, when an agricultural fair was held in Pittsfield, Mass., undoubtedly have been influenced by what they saw and did at them." David M. Granahan (page 655).

"Farmhouses of the 1860's were the monuments of the times and the men who built them. There were houses of sod and adobe and houses of logs, columned plantation houses of brick or clapboard, and ornate Victorian houses with fancy fretwork.

"As social and economic changes continue to influence the living patterns of farm families, the concepts of what constitutes a good house will also have to change. We can expect that the farmhouse of 100 years hence will differ markedly from that of today, perhaps as much as today's differs from that of the 1860's." Avis M. Woolrich and Mildred S. Howard (pages 658 and 663).

"Some of the difference in spending now and a century ago is related to food prices. Most prices were lower then, but not all. Sugar, for instance, cost 15 cents a pound wholesale in 1862.... Food prices have increased on the average less than incomes, and the average working man's wage today buys more food than did the wages of wage earners 100 years ago." Faith Clark (page 666).

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